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ABSTRACT

Because the science of nursing is still at an early stage of development, nurses involved in clinical research often find that no appropriate measures are available to sample the theoretical construct of interest. Researchers often must design and test new instruments before proceeding to test theory. A study of the effect of nurse-client contracting on family planning knowledge and behaviors in a university student population required the development of a new instrument. For nursing research, it was necessary to obtain pre- and post-test data about the extent of client knowledge about family planning. For clinical nursing assessment, it was essential to make a complete and accurate appraisal of the client's knowledge about family planning. Test items were written and rated by three expert judges for face validity and for content validity. Item revision resulted in an 86-item instrument on human fertility, reproduction, and contraception. The instrument was field-tested with 38 female university students. While the resulting test-retest reliabilty was adequate, problems arose in examining construct validity. By reducing the instrument to 46 items to meet the requirements for scientific rigor, important client data would be missing from the assessment process. A 76-item compromise instrument was developed which contained the 46 items in a construct on knowledge about family planning. The final instrument was complete, accurate, and appropriate for research. This instrument development represents one situation in which conflicting values emerge as part of the clinical nursing research process. (NB)

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THE PROBLEM OF COMPETING CLINICAL AND RESEARCH GOALS IN THE CONDUCT OF CLINICAL NURSING RESEARCH

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The Problem of Competing Clinical and Research Goals in the Conduct of Clinical Nursing Research .

Introduction

Nursing is changing rapidly these days. While major efforts are being directed toward development of better theoretical constructs on which to base our practice, we are experiencing an explosion of knowledge through increases in research efforts in the health and social sciences, and application of high-tech tools and resources in the field of health care. These environmental pressures and others inherent in modern clinical practice are a source of potential growth to the profession of nursing. They also pose a threat. The threat may come in many forms, but the essence of the resulting problem is the development of knowledge or applications of technology that are incomplete, inaccurate or inappropriate to the practice of nursing.

The issue I wish to discuss today concerns the conduct of clinical nursing research. At the present time, many of us are involved in the development of new knowledge and testing of nursing theory. We struggle to design the best clinical studies possible, within the constraints of the practice setting. And we search for appropriate data collection instruments and procedures to reflect the dimensions of practice we wish to measure. Because the science of nursing is still at an early stage of development, we frequently find that no appropriate measures are available to sample the theoretical construct of interest. And so, we must design and test new

instruments before proceeding to test theory.

Genesis of the Problem

The situation which brought to my attention the problem of competing goals in the conduct of clinical nursing research occurred during the instrument development process for a study of the effect of nurse-client contracting on family planning knowledge and behaviors in a university student population (Van Dover, 1985). The purpose of the study was to determine whether nurse-client contracting was useful as a method for providing nursing care to single, sexually active young women regarding prevention of unintended pregnancy. The design was a randomized experiment using pretest and postest dependent measures of client knowledge about family planning and client contraceptive behavior.

For the purposes of nursing research , it was necessary to obtain pre and posttest data about the extent of client knowledge about family planning. In this study, client knowledge was conceived to be necessary, but not sufficient to produce changes in client family planning behavior which would reduce risk of unintended pregnancy. On the other hand, for the purpose of clinical nursing assessment it was essential to make as complete and accurate an appraisal of the client's knowledge about family planning as possible, because this assessment was the basis for the clinical intervention which followed.

At the time the blueprint for the instrument was designed, there was no indication to the investigator that these two parallel purposes were likely to

come into conflict with each other. Perhaps this was simply a case of the investigator's naivete with respect to the conduct of clinical research. Or perhaps clinical nursing research is still at such an early stage of development, we are not yet familiar with the full range of problems which are likely to confront us.

Instrument Design

The recommendations of Nunnally (1978) and Thorndike and Hagan (1977) were followed in making a plan for construction of the data collection instruments. These included: specification of objectives, identification of content to be covered and determination of the types of items to be used, their number and degree of difficulty. A major issue in the construction of an instrument is the question of validity. Nunnally (1978, p. 86) states that a measuring instrument is valid if it does what it is intended to do.

After item writing was completed, the instruments were reviewed by three expert judges chosen by the investigator for their clinical and research experience in the field of family planning. Each of the judges gave extensive written and verbal feedback concerning face validity and content validity of the instruments, and clarity of items. You will recall that face validity refers to "the extent to which an instrument 'looks like' it measures what it is intended to measure" (Nunnally, 1978, p. 111). Content validity "is the adequacy with which a specified domain of content is sampled. The purpose of a test is to directly measure performance in a unit of instruction. The test must stand by itself as an adequate measure of what it is supposed to measure"

(Nunnally, 1978, p. 91).

On the basis of feedback from the panel of experts, the original instrument was revised. A number of items were dropped entirely, many new ones were included and others revised. The instrument which emerged from this phase had 86 True-False items, covering three major content areas: human fertility, reproduction and contraception. Next, the items were field tested. To avoid contamination of the potential subject pool at the the proposed study site, field testing of instruments was conducted at another location, with a sample of subjects who were similar to the subjects to be included in the experiment.

A sample of forty-eight female students aged 18 - 29 who were making a visit to the gynecology clinic of a moderate sized midwestern university completed the instrument at the time of their clinic visit. Another instrument was sent home with each student in a closed envelope, to be completed by the subject two weeks later. Thirty-eight of these instruments were returned, representing a response rate of 79%.

The Dilemma

Based on the responses of thirty-eight subjects, test-retest reliability of the instrument constructed to test knowledge about family planning was .93. This estimate was considered more than adequate for the research purposes of the study. But when the internal consistency or construct validity of the instrument was estimated, a real dilemma emerged.

What is construct validity? "To the extent that a variable is abstract, rather than concrete, we speak of it as being a construct. All theories in

science concern statements mainly about constructs, rather than about specific, observable variables" (Nunnally, 1978, p. 96-98). For example, in a study about the relationship between social support and help-seeking behaviors of clients, "social support" is an example of a construct. If we believe that social support is important to clients, we must decide on a definition of this construct and then find a way to measure social support. In this study, "client knowledge about family planning" was an important construct. The researcher thought it reasonable that the instrument have construct validity, since a global measure of client knowledge was necessary for hypothesis testing.

The construct validity or internal consistency of the family planning knowledge quiz was estimated using Chronbach's alpha and the stepwise item analysis package availible with the Osiris data analysis program and SRC:LIB software available through the Survey Research Center of the Institute for Social Research at The University of Michigan. The first test of coefficient alpha for the 86 item total produced a value of .53 whereas Nunnally's criteria for alpha for a newly constructed test is .70 (Nunnally, 1978, p. 245). What a disappointment! Clearly, some items would have to be dropped from the measure, in order to satisfy the requirement for construct validity of the instrument. But which items? By this time, the investigator was becoming quite nervous about an instrument in which a great deal of time and energy had been invested. Ten of the items on the original measure showed minimal variance among all 48 of the respondents on which the analysis was based. Subjects consistently responded correctly to those items, so they were deleted. This was done

because the items were not helpful in discriminating between subjects who were more vs. less knowledgeable about family planning. The remaining 76 items were subjected to stepwise item analysis, for the purpose of distilling the item pool. The objective was to reduce the number of items to the point where they would provide a measure of subject knowledge that was internally consistent. When the number crunching was done, thirty items had been rejected, and the remaining 46 items had a lovely, acceptable alpha of .78. The objective researcher should have been satisfied. Right?

Now, anyone who has developed an instrument for research purposes knows the pain of giving up items when the alpha crunch comes along. But when the scientist is a nurse, and sees items critical to the assessment process of client care being rejected by the computer, the insult becomes more than a matter of professional pride. In fact, it becomes a value conflict, and therefore a matter of clinical ethics.

How could such a large number of items, which had passed the tests of face and construct validity, important criteria for both a research and clinical measure, be left out of the assessment process? This was the question I pondered for several difficult days. If the instrument were reduced to 46 items to meet the requirement for scientfic rigor, important client data would be missing from the assessment procedure. And if the instrument were left "as is" it would adequately sample clients' knowledge about family planning, but could not be used to accurately measure the research construct which was to be tested in the clinical setting.

The possibility of constructing two separate instruments, one to be

used for each of the purposes outlined above, was considered. This course of action was rejected because of the awkwardness and redundancy it would produce for the client.

Solution and Resolution

After careful consideration of the implications of several courses of action, a solution was chosen which the investigator thought would satisfy requirements for sound clinical practice and produce an instrument what was acceptable for use in research. Essentially, this was a compromise solution which offered the scientist practitioner the "best of both worlds" and made the best possible use of the client's time commitment to the study.

The 76 - item measure which remained after "minimum variance" items were dropped was used as the basic measure for purposes of clinical assessment. Subsections within the measure were "Human Fertility", "Reproduction", and "Contraception". This questionnaire gave the nurse a relatively comprehensive picture of the client's knowledge level at the beginning of the study. It was an important basis for assessment and nurse-client counseling. Within this measure were nested the 46 - items which comprised the construct, "Knowledge about family planning." These items were combined to obtain a measure which would satisfy the criteria for a construct appropriate for use in research.

In order to make it simpler to score the knowledge quiz for research purposes, the items were rearranged. Items which were to be used as a construct for hypothesis testing were placed at the beginning of each subsection of the quiz, followed by other items which were to be used

exclusively for the nurse's assessment process with the client.

As a result of this rearrangement of items, a measure was constructed which was complete ,in that it allowed for an adequate sampling of the client's knowledge base, accurate ,in that it provided important feedback to both nurse and client about the client's need for family planning information, and appropriate for research from the point of view of the need for valid measures of research constructs.

This paper is presented as one means of alerting researchers and clinicians about the possibility of encountering situations in which conflicting values emerge as part of the clinical nursing research process.

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